the mat so that the first coating moves through the gap with the mat. In the illustrated embodiment, the first coating is supplied by a trough 70 to the nip 72 between the upper and lower squeeze rolls. However, it could also be supplied at a location before the nip. The first coating is fed to the applicator via a pipeline (not shown) from a first coating supply source (not shown).

The squeeze rolls force the first coating to enter and saturate the mat and to form a layer on the bottom surface 52 of the mat (which is now oriented upward). The size of the gap between the squeeze rolls controls the thickness of the layer of first coating on the bottom surface of the mat. Preferably, the upper squeeze roll 66 rotates in a direction so that the surface of the upper squeeze roll adjacent the mat moves in a direction opposite the direction of the mat. The opposite direction of movement of the upper squeeze roll promotes a smooth surface of the first coating. Preferably, the lower squeeze roll 68 rotates in a direction so that the surface of the lower squeeze roll adjacent the mat moves in the same direction as the mat.

In a second coating operation, indicated generally at 74, a second asphalt-based coating 76 is continuously applied to the top surface 54 of the mat 50 (now oriented downward) in a manner so that the second coating forms a layer on the top surface. In some preferred embodiments of the invention, the second coating has different properties from the first coating. However, in other embodiments of the invention, the second coating can be the same type of coating as the first coating, having the same properties. In the embodiment shown, the second coating is applied to the mat with a large applicator roll 78. Roll 79 positioned beside the applicator roll forms the other surface of the reservoir for the coating 76. The second coating 76 is supplied to the reservoir by an applicator (not shown) and flows onto the applicator roll 78 for application to the mat. In the illustrated embodiment, the second coating operation also employs a metering bar or roll 80 positioned adjacent the applicator roll with a gap 82 therebetween.

The metering roll wipes off all but the desired film thickness, set by the size of the gap between the applicator roll and the metering roll.

The applicator roll usually rotates in a direction so that the surface of the applicator roll adjacent the mat moves in the same direction as the mat, and the surface of the applicator roll moves at a speed preferably relatively close to the sheet speed, preferably within a range of from about 90% to about 110% of the speed of the mat. One skilled in the art appreciates that the speed range may be adjusted to achieve proper coating of the mat. The metering roll rotates in a direction opposite the direction of the applicator roll so that the second coating is held in the reservoir. Preferably, the mat wraps on the applicator roll to promote wetting and transfer of the second coating to the mat, more preferably over at least about 120 degrees of the roll (it wraps 180 degrees in the embodiment shown).

Preferably, the second coating operation employs a device 84 to scrape the second coating from the surface of the applicator roll and smoothly apply the coating to the mat. In the illustrated embodiment, the device is generally bar-shaped, and it is positioned in the nip (indicated generally at 86) between the applicator roll and the mat. Such a device can help to ensure substantially 100% transfer of the coating from the roll to the mat.

Preferably, the first and second coating operations can be independently controlled in a dial-in mode in which control parameters are set once and do not require adjustment throughout the continuous process. Such a process is much more efficient than a process requiring feedback and adjustment of the controls.

After the first and second coatings have been applied to the mat, the mat moves over a rounded exit support 88 for further process steps (not shown) in the manufacture of the roofing material, such as granule application, cooling and cutting.

In the embodiment of the process shown in Fig. 6, the mat 50 is not inverted before the first coating operation. Consequently, the bottom surface 52 of the mat is oriented downward when applying the first coating to the bottom surface. Like in the first embodiment, the process includes a first coating operation, indicated generally at 90, in which the first coating is continuously applied to the bottom surface of the mat in a manner so that the first coating saturates the mat and forms a layer on the bottom surface. In the embodiment shown, the first coating operation involves moving the mat through a gap 92 between an upper squeeze roll 94 and a lower squeeze roll 96. The first coating 62 is supplied to a location before the gap and below the mat so that the first coating moves through the gap with the mat. The squeeze rolls force the first coating to enter and saturate the mat and to form a layer on the bottom surface of the mat. The size of the gap between the upper squeeze roll and the lower squeeze roll controls the thickness of the layer of first coating.

Preferably, the lower squeeze roll 96 rotates in a direction so that the surface of the lower squeeze roll adjacent the mat moves in a direction opposite the direction of movement of the mat. The opposite direction of movement of the lower squeeze roll promotes a smooth surface of the first coating. Preferably, the upper squeeze roll 94 rotates in a direction so that the surface of the upper squeeze roll adjacent the mat moves in the same direction as the mat.

The first coating can be supplied to the location before the gap and below the mat in any suitable manner. Preferably, the first coating is supplied by applying a layer of the first coating to the bottom surface of the mat before moving the mat through the squeeze rolls. In the embodiment shown in Fig. 6, the first coating is supplied by applying the layer of first coating to the bottom surface of the mat with an inking roll 98 which draws molten coating from a tub 97. The inking roll slathers on a layer of the first coating for use in the squeeze rolls. A metering bar 99 defines a gap where coating is allowed to pass, thereby